CLAIMS

1. A method for verifying a parameter setting of an implantable device having a plurality of adjustable parameter settings, comprising the steps of:

providing an acoustic monitoring system including an adjuster mechanism for adjusting a parameter setting of the implantable device, a transmitter electronically coupled to the adjuster mechanism, and a sensor electronically coupled to the transmitter for detecting an acoustic signal generated from the implantable device during an adjustment cycle;

placing the system in proximity to the implantable device;

adjusting a parameter setting of the implantable device;

detecting any acoustic signals generated from the implantable device during the adjustment cycle;

analyzing the acoustic signals; and

generating a signal to confirm the success or failure of the adjustment.

2. The method of claim 1, wherein the implantable device includes a valve mechanism, and the parameter settings are valve settings.

3. The method of claim 2, wherein the step of placing the system further comprises positioning the transmitter over the valve mechanism.

4. The method of claim 1, wherein the sensor is held by a tubular coupling rod within the transmitter, and further including the step of contacting the tubular coupling rod to the patient's skin.

5. The method of claim 4, further including the step of applying a transmissive media to the patient's skin to optimize coupling between the tubular coupling rod and the implantable device.

6. The method of claim 5, wherein the transmissive media is an ultrasound gel.

7. The method of claim 2, wherein the step of adjusting comprises applying a magnetic field generated by the transmitter to the valve mechanism during the adjustment cycle.

8. The method of claim 2, wherein the step of adjusting comprises applying an electromagnetic field generated by the transmitter to the valve mechanism during the adjustment cycle.

9. The method of claim 2, wherein the valve mechanism includes a moveable actuator, and the step of adjusting further includes moving the actuator to adjust the opening pressure of the valve mechanism.

10. The method of claim 9, wherein the actuator is a rotatable motor, and the step of moving includes rotating the motor.

11. The method of claim 1, further including the step of inserting the sensor into the transmitter after positioning the transmitter over the implantable device.

12. The method of claim 1, wherein the step of analyzing includes translating each of the detected acoustic signals generated from the implantable device to an electronic signal for determining the success or failure of the adjustment cycle.

13. The method of claim 12, further including the step of classifying the acoustic signals into signals indicative of movement and signals indicative of positions.

14. The method of claim 13, wherein the step of classifying further includes determining a starting position of the adjustable parameter settings.

15. The method of claim 1, wherein the step of analyzing includes comparing the actual stream of acoustic signals to an expected stream of acoustic signals to determine the success or failure of the adjustment cycle.

16. The method of claim 1, wherein the step of generating a signal to confirm the success or failure of the adjustment includes generating an audible or visual signal.

17. The method of claim 15, wherein if no stream of acoustic signals is detected, then further including the step of generating a signal to indicate an error event.

18. The method of claim 17, wherein the error event is due to the positioning of the transmitter with respect to the implantable device.

19. The method of claim 17, wherein the error event is due to a malfunction of the implantable device.

20. An acoustic monitoring device for verifying the pressure setting of a valve mechanism in an implantable device having a plurality of adjustable valve settings, comprising:

a transmitter configured to generate an energy field sufficient to effect movement of the valve mechanism of the implantable device; and

an acoustic sensor electronically coupled to the transmitter for detecting any acoustic signals generated by the valve mechanism during an adjustment cycle.

21. The device of claim 20, wherein the transmitter includes a plurality of electromagnetic coils for generating an electromagnetic field sufficient to cause movement of the valve mechanism.

22. The device of claim 20, wherein the energy field is a magnetic field.

23. The device of claim 20, further including a housing having a top surface, a bottom surface, and a central opening extending therethrough for containing the transmitter.

24. The device of claim 23, further including a tubular coupling member extending through the central opening and beyond the bottom surface of the housing.

25. The device of claim 24, wherein the tubular coupling member is configured to contact a patient's skin.

26. The device of claim 24, wherein the acoustic sensor is selectively disposed within the tubular coupling member.

27. The device of claim 26, wherein the acoustic sensor is electromagnetically isolated from the transmitter.

28. The device of claim 26, further including mechanical isolating pads surrounding the inner surface of the tubular coupling member.

29. The device of claim 26, wherein the sensor is seated on top of the tubular coupling member.

30. The device of claim 26, further including a plurality of feet extending from the bottom surface of the housing to focus the generated energy field on the valve mechanism.

31. The device of claim 20, further including a power source for driving the energy field. .

32. The device of claim 20, further including a signal amplifier, a digitizing filter, and a data storage unit for transmitting any detected acoustic signals to a programmer for analysis.

33. The device of claim 32, further comprising means for wireless communication between the acoustic monitoring device and the programmer.

34. The device of claim 33, wherein the means for wireless communication comprises a wireless communication transmitter connected to the transmitter of the acoustic monitoring device.

35. The device of claim 24, wherein the acoustic sensor is inserted into the housing after the housing is placed over the valve mechanism.

36. The device of claim 24, wherein the tubular coupling member is held in springing engagement with respect to the housing and self-adjusts to conform to the patient's anatomy.

37. An acoustic monitoring system for verifying the pressure setting of a valve mechanism in an implantable device having a plurality of adjustable valve settings, comprising:

a device for adjusting an opening pressure of the valve mechanism;

a transmitter configured to generate an energy field sufficient to cause movement of the valve mechanism; and

an acoustic sensor electrically coupled to the transmitter for detecting any acoustic signals generated by the valve mechanism during an adjustment cycle;

wherein the transmitter communicates the detected acoustic signal to the device for analysis.

38. The system of claim 37, wherein the device includes a microprocessor that translates any detected acoustic signals into information for determining the success or failure of the adjustment cycle.

39. The system of claim 38, wherein the microprocessor classifies the acoustic signals into signals indicative of movements and signals indicative of positions.

40. The system of claim 39, wherein the microprocessor compares the actual streams of acoustic signals to an expected stream of acoustic signals to determine the success or failure of the adjustment cycle.

41. A method for non-invasive interrogation of a valve mechanism in an implantable device having a plurality of adjustable valve settings, comprising the steps of:

providing an acoustic monitoring device configured to detect acoustic signals generated from the valve mechanism during an adjustment cycle;

applying the device to the valve mechanism to detect any acoustic signals generated from the valve mechanism during the adjustment cycle;

analyzing the acoustic signals for signals indicative of movements and signals indicative of positions; and

generating a signal to confirm the success or failure of the adjustment.